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나이에 따른 중부요도 슬링수술의 치료 성적 비교

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Outcome of mid urethral sling procedures according to age

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Objective: To compare the morbidity and treatment outcomes of mid urethral sling procedures for older women and younger women, and to evaluate whether mid urethral sling procedures can be effectively used in older women.

Methods: This retrospective study included 381 patients who underwent mid urethral sling procedures, tension free vaginal tape (TVT) or transobturator tape (TOT) for urodynamic stress urinary incontinence from March 2000 to June 2006. The patients were divided into two age groups: younger women (30~69 years old) and older women (70~90 years old). Patients were followed up with clinic visits at 1, 3, 6, 12 months, and every year thereafter.

Results: 341 (89.7%) were in younger women, 40 (10.5%) in older women. The rates of intra and perioperative complications including hemoglobin difference, urinary retention, UTI, mesh erosion, wound infection were no significant differences between the groups. De novo urgency was more common in older women than younger women (15.9% vs. 30.0%: $P<0.001$). The subjective cure rate at 1 year follow up (82.2% vs. 91.3%: $P>0.05$) showed no significant differences.

Conclusion: Our data showed subjective cure rates without any significant increase in intraoperative complications in older women. Postoperative complications of de novo urgency were more common in the older women. Hospital stay and recovery period were short, making TVT and TOT a suitable procedure for all ages.

Key Words: Tension free vaginal tape, Transobturator tape, Age, Stress urinary incontinence, Outcome

Introduction

Stress urinary incontinence (SUI) is defined as the complaint of involuntary urine leakage on effort or exertion or on sneezing or coughing without rise in detrusor pressure.[1] Although the etiology of SUI is still poorly understood, age, pregnancy, childbirth, obesity and poor collagen turnover are considered to be the major risk factors.[2] The incidence of urinary incontinence increases with increasing age[3] due to combined factors, such as decreased estrogenization, age-related atrophy of urethral tissue and increased likelihood of a previous incontinence procedure. In USA, National Health and Nutrition Examination Survey reveal that the overall prevalence of urinary incontinence was 38% in women aged 60 and older.[4] In

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Korea, SUI is affecting 22.9% of women aged 30~79[5] and 28.7% of women aged 60 or older.[6] The older population (80 years and older) is expected to increase 69% between 2000 and 2030.[4] With the aging population and the increase in prevalence of incontinence with age, concern of the treatment of SUI is increasing.

Traditional slings placed at the bladder neck have been associated with increasing morbidity and prolonged voiding dysfunction.[7] Since increased risk caused by coexisting medical disorders, surgical procedures was avoided. In 1996, tension -free vaginal tapes (TVT) for treatment of SUI was first described.[8] Its high, long-term success rate ranges from 84% to 95%.[9,10] To avoid the complications associated with the retropubic approach, Delorme advocated the transobturator route (TOT).[11] These minimally invasive mid urethral slings have lower complication rates,[12] require shorter hospital stays and are better suited for the older women. Despite the growing number of older women and the high prevalence and bother of SUI in this age group, there are few studies published about comparing treatment outcomes between different age groups. The objective of this study was to compare the morbidity and treatment outcomes of mid urethral sling procedures between older women and younger women, and to evaluate whether mid urethral sling procedures can be effectively practiced in older women.

Materials and Methods

This retrospective study included 381 patients who were diagnosed as having SUI by Urodynamic study (UDS). The patients underwent TVT (polypropylene, Gynecare, Ethicon Inc., Somerville, NJ) or TOT (polypropylene, Iris, Dow-medics Co. Ltd., Wonju, Korea) at the urogynecologic clinic of the Department of Obstetrics and Gynecology, Yonsei University Health System, Seoul, Korea, between March 2000 and June 2006. The patients were divided into the two age group: younger women (30~69 years old) and older women (70~90 years old). All subjects were assessed with a standard questionnaire, physical examination and a urodynamic study. A standard questionnaire included age, parity, body mass index, underlying comorbidities, previous hysterectomy and anti-incontinence surgery history, menopause and hormone replacement therapy status. Pelvic organ prolapse (POP) was assessed according to the Pelvic Organ Prolapse Quantification (POP-Q) system by the same examiner. Urodynamic studies (Dantec-5000, Copenhagen, Denmark) included uroflowmetry, multichannel cystometry, urethral pressure profilometry and valsalva leak point pressure (VLPP). VLPP were determined with bladder volumes of 200 mL and 7-Fr catheter. Urethral pressure profilometry was performed with a 7-Fr catheter fitted with a transducer. The patients with mixed urinary incontinence were excluded. Intrinsic sphincter deficiency (ISD) was defined as VLPP less than 60 cm H_2O or maximal urethral closure pressure (MUCP) less than 20 cm H_2O.The TVT was introduced into our practice in January 2000 and the TOT was in September 2004. All surgeries were performed by single surgeon (Bai SW). All TVT and TOT procedures were performed in a standard fashion, as described by Ulmsten et al, and Delorme. Cystoscopy was done in TVT procedures to verify bladder injury. Postopera- tively, patients were followed up at 1, 3, 6, 12 months and every year and urinary symptoms and other problems were assessed at each visit. Perioperative complications were defined as events within postoperative 1 month; postoperative complications were after 1 month. Cure was defined as when there was no urine leakage on cough stress test with full bladder and if no subjective urinary incontinence symptoms. Urinary frequency was defined as a repeated voiding of a small volume of urine (>8 times/day) in short intervals. Urinary retention was defined as post- void residual

(PVR) greater than 100ml or did not void. De novo urgency was defined as a sudden and compelling urge to pass urine, which was newly developed postoperatively. Urinary tract infection (UTI) was defined as a positive culture finding more than 10^3 CFU/mL.

The chi-square test, Fisher's exact test and *t*-test analysis were used for statistical analysis. A *P*-value of 0.05 was considered statistically significant for all comparison. Data management and statistical analysis were performed with SPSS 12.0 for Windows (SPSS Inc., Chicago, IL)

Results

Table 1 shows clinical and demographic details of the patients in each group. Body mass index, intrinsic sphincter deficiency, concomitant hysterectomy, preoperative urgency, and type of procedure were not significantly different between the groups. Parity, the incidence of hypertension and hormone replacement therapy was higher in older group.

The rates of intra and perioperative complications including hemoglobin difference, urinary retention, UTI, mesh erosion, wound infection were not significantly different between the groups. Operation time and hospital stay were longer in older women ($P<0.05$). Perioperative de novo urgency were 15.9% in younger women and 30.0% in older women, respectively, with significant differences ($P<0.05$) (Table 2). There was no bladder perforation, bowel perforation, operation site hematoma in both groups. The rates of postoperative de novo urgency in 1 month were 40.0% in older women, with significant difference between the groups ($P<0.05$) (table 3). The postoperative cure rates in 1, 3, 6 and 12 months were no significant differences between the groups. The cure rates of postoperative 1 year were 82.2%, 91.3%, respectively ($P>0.05$) (Table 4).

Table 1. Demographic and clinical characteristics of the study population

	Younger women (N=341)	Older women (N=40)	*P*-value
Age (years), mean±SD	53.6±9.4	74.0± 4.0	<.001
BMI (kg/m^2), mean±SD	24.3±2.8	25.2±2.6	0.068
Parity, median (range)	3 (0-10)	5 (0-10)	<.001
Co morbidity			
HTN, n (%)	92 (27.0)	28 (70.0)	<.001
DM, n (%)	33 (9.7)	7 (17.5)	0.166
Disc, n (%)	15 (4.4)	1 (2.5)	0.079
Respiratory Disease, n (%)	10 (2.9)	2 (5.0)	0.067
Menopausal status, n (%)	210 (61.6)	40 (100)	<.001
HRT, n (%)	67 (32.0)	4 (10.0)	0.005
ISD	87 (25.5)	12 (30.0)	0.540
Concomitant hysterectomy, n (%)	46 (13.5)	5 (12.5)	0.675
Preoperative urgency, n (%)	86 (25.2)	11 (27.5)	0.754
Type of procedure			
TVT, n (%)	192 (56.3)	20 (50.0)	0.448
TOT, n (%)	149 (43.7)	20 (50.0)	

BMI: body mass index, HRT: hormone replacement therapy, ISD: intrinsic sphincter deficiency.

Table 2. Intraoperative and perioperative complications in age groups

	Younger women (N=341)	Older women (N=40)	*P*-value
OP time (min), mean±SD	73.4±54.3	108.2±62.4	0.001
Hb difference (g/dL), mean±SD	1.5±2.0	1.9±1.3	0.166
Hospital stay(day), mean±SD	4.8±3.7	7.3±4.7	<.001
De novo urgency, n (%)	54 (15.9)	12 (30.0)	0.026
Urinary retention, n (%)	89 (26.1)	16 (40.0)	0.063
UTI, n (%)	9 (2.7)	0 (0.0)	0.606
Mesh erosion, n (%)	1 (0.3)	0 (0)	1.000
Wound infection, n (%)	5 (1.5)	1 (2.5)	0.488

OP: operation, Hb: hemoglobin, UTI: urinary tract infection.

Table 3. Postoperative complications in age groups

	Younger women (N=341)	Older women (N=40)	*P*-value
Urinary retention, n (%)	41 (12.0)	5 (12.5)	0.726
De novo Urgency, n (%)	44 (13.0)	16 (40.0)	<.0001
UTI, n (%)	13 (4.0)	2 (5.0)	0.533
Constipation, n (%)	5 (1.5)	0 (0)	0.518
Erosion, granulation, n (%)	2 (0.6)	1 (2.5)	0.410
Dyspareunia, n (%)	1 (0.3)	1 (2.5)	0.159

Table 4. Cure rates of mid urethral sling procedure in the younger and older group

	Younger women (N=341)	Older women (N=40)	*P*-value
Follow up (month), median (min-max)	12 (1-84)	12 (1-60)	
Cure			
1 month, n (%)	325 (95.3)	38 (95.0)	1.000
3 month, n (%)	257 (79.1)	33 (86.8)	0.865
6 month, n (%)	185 (72.0)	23 (69.7)	1.000
12 month, n (%)	152 (82.2)	21 (91.3)	0.748

Discussion

With the aging population and the increase in prevalence of incontinence with age, the demand for safe, effective treatments for incontinence is increasing. Older women have lower urethral pressures, co morbidities; cure rates are expected to low. In previous studies, de novo urge symptoms were found to more common in the elderly compared with younger. In fact, postoperative urge symptoms were 4 times more common in women over 65 years of age than those under 65.[13] Previously, traditional sling procedures in the elderly women is complicated by the high incidence of detrusor overactivity, voiding dysfunction and ISD.[14] Aging is responsible for modifications at the vesical sphincteric system level resulting clinically in a bladder hyperactivity frequently associated with SUI and a bladder hypocontractility.[15] These bladder modifica-

tions related to age may have an impact on the results of mid urethral sling procedures.[16] In addition, their surgical procedures pose a challenge since elderly women are likely to suffer significant pre- and intra-operative morbidity and have a slower recovery. Despite this concern, elderly women undergoing mid urethral sling procedures have similar cure rates as younger women. In this study, most perioperative outcomes after mid urethral sling procedures of older women were comparable to those of younger women. These outcomes included cure rate, urinary retention, wound infection, recurrent UTI, and mesh erosion. In this study, patients were divided into the two age group. The definition of elderly is 65 years or older in epidemiology, but by the national health interview survey, the prevalence of urinary incontinence in Korean population is 40% after 70 years old[6] and the patients between 65~70 years old did not remarkable increase in co-morbidity compared to the patients under 65 years old. Previous studies also analyzed the outcome by dividing the population into older and younger women by using age 70 as reference age.[16]

Postoperative de novo urge incontinence was significantly more frequent in older women (40.0%, $P<0.001$). Reported frequencies have been distributed from 3.1%[17] to 25.9%.[18] While the origin of de novo urgency and its mechanisms are poorly understood, bladder outlet obstruction is thought to be one of them. Women with obstruction have been shown to have detrusor instability in a higher degree than women with no signs of obstruction. This could be the explanation in some patients, but in most patients no evidence of obstruction can be detected. Damage to bladder autonomic denervation causing detrusor hypersensitivity has also been suggested to be a cause of de novo urgency.

The majority of the younger women group, urgency did not continue more than 6 months. Two patients had urgency after 1 year. One obstructed patient with urgency who had received tape release did not improve with anticholinergic medication, at 6 months SUI recurred so TVT was repeated. In the older women group who developed de novo urgency, four patients had urgency lasting more than 1 year and in two of them incontinence recurred. Urgency did not continue after 1 year in most patients.

Duration of hospital stay is longer and transfusion rates are higher in older women, patients with pelvic organ prolapse (Stage≥2) are underwent concomitant surgeries. Other complications did not differ between the groups.

In previous studies, the rate of clinically significant bleeding and hematoma formation ranged from 0.8% to 10%. (19, 20) Bowel injury is a very rare complication documented in case reports. The most common intra-operative complication of the mid urethral sling procedure is bladder perforation, complicating 3% to 10% of procedures.[19,20] Postoperative complication including mesh erosion or infection is uncommon. De novo urgency and urge urinary incontinence have been associated with procedures, ranging from 5% to 25%.[21]

The overall cure rate was about 95%, similar to the previous studies.[22] After long term follow up; the cure rate has not been declined depending on age. In general, morbidity and mortality from surgery rise as patient's age increases. However, these mid urethral procedures seem to be very suitable for all ages, particularly for elderly due to their minimal invasiveness. No major complications including bladder perforation, bowel injury, and urethral injury were noted in any of the patients.

This study has confirmed the feasibility and safety of the TOT and TVT when applied to elderly women. Further randomized controlled studies are required to give more accurate results. Physicians should be skeptical and look for outcome data before using them in individual patients.

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= 국문초록 =

목적: 중부요도 슬링수술을 시행받은 환자를 70세 이상 그룹과 70세 미만 그룹으로 나누어 치료성적 및 합병증을 비교하고, 70세 이상 그룹에서 효과적인지 평가하고자 하였다.

연구 방법: 2000년 3월부터 2006년 6월까지 본원에 내원하여 복압성 요실금으로 진단받은 381명의 환자들을 대상으로 후향적으로 연구를 시행하였다. 환자를 70세 미만 그룹과 70세 이상 그룹의 두 군으로 나누어 비교 분석하였다. 수술 1, 3, 6 그리고 12개월 후에 완치 여부와 합병증을 비교하였고 통계 분석은 chi-square test, Fisher's exact test와 *t*-test를 이용하였다.

결과: 전체 381명 중 70세 이상 환자는 40명 (10.5%)이었다. 수술 전후의 혈색소 차이, 요정체, 요로감염, mesh 미란, 상처 감염의 비율은 두 그룹간에 유의한 차이가 없었다. 새로 발생한 절박뇨는 70세 이상 그룹에서 그렇지 않은 그룹보다 유의하게 높았다 (15.9% vs. 30.0%, $P<0.001$). 수술 1년 후 완치율을 비교하였을 때 두 그룹 간에 유의한 차이가 없었다. (82.2 % vs. 91.3%: $P>0.05$).

결론: 70세 이상 환자에서 70세 미만 환자들에 비해 중부요도 슬링수술 시행 전후 유의한 합병증과 완치율의 차이가 없었다. 수술 후 새로 발생한 절박뇨는 70세 이상 그룹에서 높았다. 복압성 요실금 치료로서 중부요도 슬링수술은 짧은 재원 기간과 회복 기간이 요구되며 전 연령에서 모두 안전 하고 효과적인 수술 방법이다.

중심단어: 중부요도 슬링수술, 나이, 치료 성적